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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Douglas Zhu

Group Art Unit: 3742

Examiner: Leonid Fastovsky

Serial No.: 10/709,753

Filed: May 26, 2004

For: METHOD AND SYSTEM FOR A VEHICLE BATTERY TEMPERATURE CONTROL

Attorney Docket No.: FMC 1698 PUS / 81094465

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Mail Stop Appeal Brief - Patents
Commissioner for Patents
U.S. Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an Appeal Brief from the final rejection of claims 1-20 of the Office Action mailed on August 5, 2005 for the above-identified patent application.

I. REAL PARTY IN INTEREST

The real party in interest is Ford Global Technologies, LLC ("Assignee"), a corporation organized and existing under the laws of the state of Delaware, and having a place of business at One Parklane Blvd., Suite 600, Dearborn, MI 48126, as set forth in the assignment recorded in the U.S. Patent and Trademark Office on May 26, 2004 at Reel 014659/Frame 0158.

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II. RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences known to the Appellant, the Appellant's legal representative, or the Assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-20 are pending in this application. Claims 1-20 have been rejected and are the subject of this appeal.

IV. STATUS OF AMENDMENTS

An amendment after final rejection was filed with this appeal brief and included amendments to rewrite patentable dependent claims 9, 11, and 12 in independent form. The entry of this amendment is unknown at the time of filing this appeal brief.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention relates to a method and system of heating vehicle batteries. (paragraph 2). The method and system, as recited in independent claims 1, 10, and 13, relate to controlling battery heating. The battery heating is permitted in response to a controller determining a vehicle shut-down condition. (paragraphs 36-38) The battery is heated by controlling/enabling energy from a vehicle battery to a heater associated therewith. (paragraphs 25-27, 34-35, 57)

Independent claim 10 further requires the controller to be a vehicle system controller. The vehicle system controller is included on the vehicle. (paragraphs 28, 42)

Dependent claims 2-4 and 14-16 relate to controlling the controller to a sleep/suspend mode in response to determining vehicle shut-down and thereafter waking

up/activating the controller to controller battery heating. (paragraphs 39-42)

Dependent claims 7, 8, and 18-20 relate to limiting batter heating, i.e., energy flow from the battery to the heater, as a function of battery state of charge (SOC). (paragraphs 47-53)

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 1-6, 10, 13, 17, and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over USPN 5,280,158 to Matava (hereinafter Matava) in view of USPN 5,362,942 to Vanderslice, Jr. (hereinafter Vanderslice);and

2. claims 7, 8, 14-16, 19, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Matava in view of Vanderslice and further in view of USPN 6,424,157 to Gollomp (hereinafter Gollomp).

VII. ARGUMENT

A. Claims 1-6, 10, 13, 17, and 18 Are Patentable Under 35 U.S.C. § 103(a) Over Matava and Vanderslice

This rejection applies to independent claims 1, 10, and 13. The Appellants submit that there the cited references fail to teach each element recited in the independent claims.

Independent claims 1, 10, and 13 each include limitations directed towards determining a vehicle shut-down condition and controlling energy flow from a battery to a heater in order to heat the battery. The battery heating is predicated upon determining the

vehicle shut-down condition. The Examiner asserts that Matava inherently discloses determining the vehicle shut-down condition and that Vanderslice teaches controlling energy flow from a battery to a heat in order to heat the battery.

Matava relates to a standalone controller having a number of independent current switching channels (connections) to which a vehicle can be connected to receive power. For example, vehicles stored a service garage can be connected to controller so that a heating element can be powered for heating a vehicle device. (column 3, lines 18-30) At the completion of the heating, the user disconnects the vehicle from the controller and puts the vehicle into service so that the same connection can be used to power heaters on other vehicles. (column 6-7, lines 66-11)

Matava powers the controller with user actuation of a master switch. (column 5, lines 22-24). The user may then enter a time of day into the controller for use in stopping -- not starting -- power flow to the vehicle heaters. (column 5, 35-56; column 6, lines 49-51). In more detail, the power flow is triggered by ambient temperature (column 6, lines 22-26) and stopped, regardless of ambient temperature, when the next use time is zero, i.e., at a particular time of day. (column 6, lines 22-26)

The Examiner admits Matava fails to particularly disclose starting power flow to the vehicle as function of determining a vehicle shut-down condition. However, the Examiner nonetheless asserts that Matava inherently describes doing so.

With respect to inherency, MPEP § 2112 states:

> To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is **necessarily present** in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however,

may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is **not sufficient**.' In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)

In relying upon the theory of inherency, the examiner must provide a **basis in fact and/or technical reasoning** to reasonably support the determination that the allegedly inherent characteristic **necessarily flows** from the teachings of the applied prior art. Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)

The Examiner has provided no basis in fact and/or technical reasoning to support his position that determining a vehicle shutdown condition necessarily flows from the teachings of Matava. The Examiner cannot provide such reasoning because Matava specifically teaches away from determining a vehicle shut-down condition.

The determine a vehicle shut-down condition, Matava must have some level of closed loop control, i.e., there must be at least some measure of sensing or measuring feedback to the Matava controller in order for the Matava controller to determine a vehicle shut-down condition. Matava not only fails to teach receiving feedback from the vehicles, Matava touts its ability to eliminate the need for closed loop control. (column 8, lines 29-32)

Accordingly, determination of a vehicle shut-down condition does not necessarily flow from the teachings of Matava. The Examiner is incorrect. Matava does not inherently disclose determining a vehicle shut-down condition. Vanderslice, while not asserted by the Examiner for this teaching, also fails to disclose determining a vehicle shut-down condition.

Consequently, the cited references fail to disclose each feature recited in independent claims 1, 10, and 13. These independent claims and dependent claims 2-6 and 17-18, which depend therefrom and include all the limitations thereof, are therefore, patentable

and nonobvious over the cited references.

1. Independent Claim 10 Is Separately Patentable Under 35 U.S.C. § 103(a) Over Matava and Vanderslice

The Appellants submit independent claim 10 is separately patentable over independent claims 1 and 13. Independent claim 10 includes limitations directed towards the controller used to determine the vehicle shut-down condition and to control heating of the battery to be a vehicle controller included in a vehicle. None of the references cited by the Examiner teach such a vehicle controller. As noted above, Matava teaches a standalone controller to which multiple vehicles may be connected. The Matava controller cannot be included in the vehicle.

2. Claim 2-4 Are Separately Patentable Under 35 U.S.C. § 103(a) Over Matava and Vanderslice

The Appellants submit dependent claims 2-4 are separately patentable over independent claim 1. Dependent claims 2-4 relate to placing the controlling in a suspend mode after determining the vehicle shut-down condition and prior to enabling battery heating (claim 2) such that the controller must be placed into active mode before battery heating can begin (claim 3). Optionally, active mode may be instigate after the controller is in suspend mode for a predefined period of time (claim 4).

None of the references cited by the Examiner teach suspending operation of the controller in response to determining the vehicle shut-down condition and thereafter activating the controller to control battery heating. Matava merely disclose user activation of a switch to initiate powering the vehicle. This does not teaching controlling the controller to a suspend mode and thereafter automatically activating the controller.

The Examiner has failed to particularly address the rejection of these claims. The Examiner is invited to review MPEP § 706.02(j), which states "the initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. It is important for an examiner to properly communicate the basis for a rejection so that the issues can be identified early and the applicant can be given fair opportunity to reply."

Consequently, the Appellants submit claims 2-4 are separately patentable over the cited references.

B. Claims 7, 8, 14-16, 19, and 20 Are Patentable Under 35 U.S.C. § 103(a) Matava, Vanderslice, and Gollomp

This rejection applies to two groups of separately patentable dependent claims, which are addressed below in more detail.

1. Claim 7, 8, 19, and 20 Are Separately Patentable Under 35 U.S.C. § 103(a) Over Matava, Vanderslice, and Gollomp

This group of dependent claims relates to limiting battery heating as a function of battery state of charge. The Examiner admits that neither Matava or Vanderslice teach these limitations. The Examiners instead relies on the teachings of Gollomp.

Gollomp relates to a method and system of monitoring batteries used in vehicles. (column 1, lines 7-11). Gollomp effects real-time notification to a vehicle user of battery state of charge (SOC), engine start alert capabilities, battery reserve capabilities, and others. (column 3, lines 25-56). Gollomp, however, fails to teach automatically controlling battery heating as a function of battery SOC and the Examiner has failed to point out any teaching within Gollomp to support that it does.

Accordingly, the Appellants submit dependent claims 7, 8, 19, and 20 are patentable for at least the same reasons as the independent claims from which they depend are patentable, and that these claims are separately patentable over the corresponding independent claims for the reasons stated above.

2. Claims 14-16 Are Separately Patentable Under 35 U.S.C. § 103(a) Over Matava, Vanderslice, and Gollomp

This group of dependent claims relates to placing the controlling in a sleep mode after determining the vehicle shut-down condition and prior to enabling battery heating (claim 14) such that the controller must be placed into active mode before battery heating can begin (claim 15). Optionally, active mode may be instigate after the controller is in suspend mode for a predefined period of time (claim 16).

The Examiner admits that neither Matava or Vanderslice teach these limitations. (final Office Action, paragraph 3) The Examiner instead relies on the teachings of Gollomp. Gollomp merely recognizes vehicle controllers may be in a sleep mode and that some computations may take place during sleep mode, such as the computations of Matava associated with monitoring battery operation.

Gollomp, however, fails to disclose waking up/activating the controller from the sleep mode to control battery heating, as recited in dependent claims 14-16. Accordingly, the Appellants submit dependent claims 14-16 are patentable for at least the same reasons as the independent claim from which they depend is patentable, and that these claims are separately patentable over the corresponding independent claim for the reasons stated above.

With respect to the rejection of claims 14-16, the Examiner admits the failure of Matava and Vanderslice to teach a sleep mode. The Appellants question whether this admission is commiserate with the Examiner's assertion that claims 2-4 are taught by Matava

and Vanderslice. Claims 2-4 claim a suspend mode, which is equivalent to a sleep mode. It seems inapposite for the Examiner to assert that Matava and Vanderslice disclose a suspend mode but not a sleep mode.

VIII. CONCLUSION

In view of the foregoing, the Appellants respectfully submit that each rejection has been fully replied to and traversed and that the case is in condition to pass to issue.

The Commissioner is hereby authorized to charge the fee of $500.00 Appeal Brief fee, as well as any additional fees associated with this filing, to the Deposit Account of Ford Global Technologies LLC, No. 06-1510.

Respectfully submitted,

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By: _____

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Enclosure - Appendices

VIII. CLAIMS APPENDIX

1. A method for heating a battery in a vehicle having a battery heater, the method comprising:

determining a vehicle shut-down condition; and

enabling energy flow from the battery to the heater to heat the battery after determining the shut-down condition.

2. The method of claim 1, wherein a controller enables energy flow from the battery to the heater, the method further comprising the step of placing the controller in a suspend mode condition in response to the determination of the shut-down condition prior to enabling energy flow from the battery to the heater.

3. The method of claim 2, further comprising placing the controller in an active mode so as to enable energy flow from the battery to the heater for heating the battery thereafter.

4. The method of claim 3, further comprising waking up the controller from the suspend mode condition to place it in the active mode after a predetermined period of time after the shut-down condition.

5. The method of claim 1, further comprising determining an ambient temperature, wherein the enabling step is performed when an ambient temperature is less than a predefined threshold.

6. The method of claim 1, further comprising determining a battery temperature, wherein the enabling step is performed when the battery temperature is less than a predefined threshold.

7. The method of claim 1, further comprising determining a battery state of charge (SOC), wherein the enabling step is performed when the battery SOC is greater than a predefined threshold.

8. The method of claim 7, wherein the enabling step further comprises limiting energy flow from the battery to the heater based on the battery SOC.

9. The method of claim 1, further comprising determining a period of time during which the shut-down condition has been active, wherein the enabling step includes preventing energy flow from the battery to the heater when the shut-down time period is greater than a non-use time period so as to limit battery drain when the vehicle is not in use for a prolonged period of time.

10. A method for heating a battery in a vehicle having a battery heater and a vehicle system controller, the method comprising:

determining a vehicle shut-down condition; and

heating the battery by enabling energy flow from the battery to the heater after the vehicle controller determines the shut-down condition.

11. The method of claim 10, further comprising enabling energy flow from the battery to the heater if the following conditions exist:

a battery temperature is less than a predefined battery temperature;

a battery state of charge (SOC) is greater than a battery threshold SOC; and

a predefined non-use period of time has not elapsed since determining the shut-down condition.

12. The method of claim 11, further comprising placing the controller in a sleep mode condition in response to determining shut-down and subsequently waking up the

controller to determine whether the conditions for heating the battery exist.

13. A battery heating system for a vehicle, the system comprising:

a heater for heating the battery; and

a controller for determining a vehicle shut-down condition, the controller enabling energy flow from the battery to the heater to heat the battery after determining the shut-down condition.

14. The system of claim 13, wherein the controller is placed in a sleep mode condition in response to determining the shut-down condition and prior to heating the battery.

15. The system of claim 14, wherein the controller is placed in an active mode condition to enable energy flow from the battery to the heater.

16. The system of claim 15, wherein the step of placing the controller in the active mode includes waiting a predetermined period of time after shut-down.

17. The system of claim 13, wherein the controller determines an ambient air temperature and enables energy flow from the battery to the heater when the ambient temperature is less than a predefined threshold.

18. The system of claim 13, wherein the controller determines battery temperature and enables energy flow from the battery to the heater when battery temperature is less than a predefined threshold.

19. The system of claim 13, wherein the controller determines battery state of charge (SOC) and enables energy flow from the battery to the heater when the battery SOC is greater than a predefined threshold.

20. The system of claim 19, wherein the controller limits energy flow from the battery to the heater based on the battery SOC.

An amendment after final rejection was filed with this appeal brief and included amendments to rewrite patentable dependent claims 9, 11, and 12 in independent form. The entry of this amendment is unknown at the time of filing this appeal brief. The following claims represent the rewritten form of claims 9, 11, and 12.

21. A method for heating a battery in a vehicle having a battery heater, the method comprising:

determining a vehicle shut-down condition;

enabling energy flow from the battery to the heater to heat the battery after determining the shut-down condition; and

determining a period of time during which the shut-down condition has been active, wherein the enabling step includes preventing energy flow from the battery to the heater when the shut-down time period is greater than a non-use time period so as to limit battery drain when the vehicle is not in use for a prolonged period of time.

22. A method for heating a battery in a vehicle having a battery heater and a vehicle system controller, the method comprising:

determining a vehicle shut-down condition; and

heating the battery by enabling energy flow from the battery to the heater after the vehicle controller determines the shut-down condition if:

a battery temperature is less than a predefined battery temperature;

a battery state of charge (SOC) is greater than a battery threshold SOC; and

a predefined non-use period of time has not elapsed since determining the shut-down condition.

23. The method of claim 22, further comprising placing the controller in a sleep mode condition in response to determining shut-down and subsequently waking up the controller to determine whether the conditions for heating the battery exist.